

# Inspection services

Inspection, diagnosis and expertise for graphite, PTFE and SiC equipment

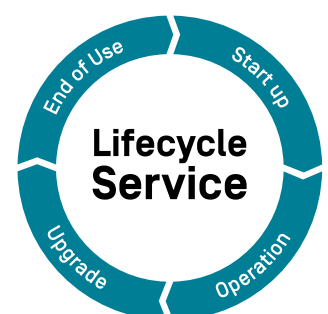


↑ Inspection of a SGL Carbon installation

SGL Carbon's expertise and customer support does not end with the delivery and installation of our products – it is the starting point. A regular inspection together with our experts reduce significantly the risk of unplanned shutdowns. Potential problems can be identified and solved before they materialize. Reduced operational costs and a maximum of lifetime and performance of your valuable assets are the result.

We support you in keeping updated with all applicable laws and regulations which are essential in corrosive and critical applications.

We support you in generating meaningful maintenance plans and documentations for your installations made of special materials where correct judgment based on specialized know-how is of high value for your safety.



## Available inspections modules

Scope elements	Mechanical	I&C	Performance	LAB
	On-site	On-site	Remote / on-site	Remote
Access <sup>2)</sup> to SGL Carbon's remote expert services				
On-site expert advice (Q&A)				
Review of incidents reports of customer for the inspected unit				
External inspection of safety relevant mechanical items e.g. springs, connections, support elements etc.				
Internal inspection <sup>1)</sup> e.g. with borescope (Process/Service site)				
On-site spare part expertise (quantity and quality evaluation)				
On-site expert advice by a specialized I&C engineer				
Inspection of I&C installations incl. safety relevant control systems provided by SGL Carbon				
Comprehensive inspection report and documentation incl. - Inspection checklist diagnosis - Result of spare part evaluation - Recommended maintenance activities				
Inspection certification release for quality audits				
Remote session (online) for clarification of actual operation conditions, DCS and field data				
Performance analysis <sup>4)</sup> and documentation of actual performance level (data input by customer required)				
Basic root cause analysis and recommended actions for performance upgrading				
Benchmark report on actual performance vs. potential performance				
Graphite material laboratory analysis to evaluate corrosive attack/ material aging. Includes sample preparation, physical properties <sup>3)</sup> and microscopy investigation (destructive test; samples necessary)				
Detailed expert evaluation and report of laboratory results				

<sup>1)</sup> only possible if installation is stopped, decontaminated and accessible thru nozzles/manhole etc.; Borescope can be provided by SGL Carbon by an extra fee of 350 € per inspection

<sup>2)</sup> Access is granted for a period of up to 12 months after an individual inspection date OR for the complete active period of a package inspection agreement (a time limitation of maximum 1 hour per case is applicable)

<sup>3)</sup> Standard physical properties incl. apparent density, specific electrical resistance, young's modulus, flexural strength, coefficient of thermal expansion. Physical analysis require a minimum sample size of 120x20x20 mm

<sup>4)</sup> Standard scope includes analysis of one operation case

## Your benefits

- **Regular safety check** of critical equipment components by OEM experts.
- **Support and expertise** for mandatory pressure vessel checks
- **Documented overview and diagnosis** of installations e.g. for internal audits and optimization projects etc.
- **Reduced shutdowns and operational costs**
- **Extended lifetime**
- **Better maintenance and budget planning**
- **Performance benchmarking** and consultants on performance upgrading

## Our offer

- **Single or regular inspection** of your installed base for graphite, PTFE and SiC equipment and systems by dedicated experts from the global market leader
- **Inspection report** about status (diagnosis) and recommended actions for your maintenance planning
- **Extended inspection services** of multi-site installed base possible to develop strategies for comprehensive maintenance and spare part management
- **Modular offer based on your specific needs** - starting from mechanical checks, up to a full engineering and process review.
- **Flexible payment schemes** from pay-per-demand to yearly fixed rates

## Recommended inspection and maintenance intervals

<b>Mechanical inspection:</b>	Yearly
<b>Performance inspection:</b>	Every 15,000 hrs or 3 years
<b>I&amp;C inspection:</b>	Every 15,000 hrs or 3 years
<b>Laboratory inspection:</b>	Every 25,000 hrs or 5 years
<b>Minimum maintenance is recommended at:</b>	Every 25,000 hrs operation time or 5 years by disassembly, cleaning and re-gasketing; to secure long term reparability and safety.
<b>Selected code requirements:</b>	Latest every 10 years detailed inspection acc. BetrSichV 2015; yearly pressure vessel check acc. PV code (China)

		Year									
		1	2	3	4	5	6	7	8	9	10
Static equipment e. g. heat exchanger, columns, quench etc.	Mechanical	█	█	█	█	█	█	█	█	█	█
	Performance			█			█			█	
	LAB						█				█
HCl synthesis unit	Mechanical	█	█	█	█	█	█	█	█	█	█
	I&C			█			█			█	
	Performance			█			█			█	
	LAB						█				█



↑ Installation of a HCl synthesis



## Inspection Certificate

### Process Technology

#### Equipment Data

Serial Number	40542342
Manufacturer	SGL CARBON GmbH
Year Built	1979
Tag No.	W303

#### Inspection Data

Inspection Date	02.02.2020
Inspection Type	Mechanical
Inspector Name	Baldermann
Report No.	W2342

#### Inspection Result

Safety relevant findings:	0
Recommended actions:	5
Next recommended inspection:	February 2021

For a safe operation all safety relevant findings of the inspection report must be implemented. Additional, SGL Carbon recommend implementing the actions as documented to secure a reliable operation of the inspected equipment.

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↑ Example of inspection certificate

## Service center and points of contact

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In addition to our global presence of Service Centers our Lifecycle Service is offered by Certified Service Partners of SGL Carbon to ensure a maximum of availability and a minimum of reaction time to our customers worldwide located. All of our external service partners are continuously trained

and fully equipped to offer standard maintenance procedures in the same quality as Service Centers.

In any case our partners are available to take care of the specific request of our customers at any time.



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